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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/805,580	03/14/2001	Hyuk Chang	030681-287	1344

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EXAMINER

YUAN, DAH WEI D

ART UNIT

PAPER NUMBER

1745

DATE MAILED: 11/19/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/805,580

Applicant(s)

CHANG ET AL.

Examiner

Dah-Wei D. Yuan

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

### Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All   b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 3.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

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**MONOPOLAR CELL PACK OF PROTON EXCHANGE MEMBRANE FUEL CELL  
AND DIRECT METHANOL FUEL CELL**

Examiner: Yuan

S.N. 09/805,580

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November 7, 2002

***Claim Rejections - 35 USC § 112***

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 1-16 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

3. The phrase "an arbitrary plane" in claim 1 is indefinite because the scope of phrase in describing the cell is unclear. For the interest of compact prosecution, claim 1 is examined as reciting "...cells being evenly disposed on a planar surface".

4. The term "hollow" in claims 1,9 is indefinite because the scope of phrase in describing the adjacent cells is unclear. For the interest of compact prosecution, claims 1 and 9 are examined as reciting "...with a spacing interposed...".

5. The term "predetermined" in claims 2,9,11 has been held to be indefinite, since applicant's specification fails to disclose criteria for determining the predetermined parameter.

See Seagram and Sons Inc. v. Mazall 84 USPQ 180 (CACD 1950).

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***Claim Rejections - 35 USC § 102***

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

7. Claims 1,6,9-11,15 are rejected under 35 U.S.C. 102(e) as being anticipated by Walsh (US 6,110,612) as evidenced in Kordes et al., (Fuel Cells and Their Applications).

With respect to claims 1,9,11, Walsh teaches a polymer electrolyte membrane fuel cell pack comprising at least four fuel cell stacks as shown in Figures 10 and 11. A structure (10) is disposed between two adjacent fuel cell stacks. Electrical connection means (96,98) are used to connect fuel cell stacks across the structure. Anode end plates and cathode end plates are disposed at either end of the cell stacks. Fuel supply (118) is connected to openings (16,20) while fuel discharge (120) is connected to opening <sup>24</sup>14, i.e., the anode is sealed to the structure (10). The structure (fuel flow stopper) directs the flow of fuel to the anode side of the fuel cell, whereas the air/oxygen to the cathode side of the fuel cell. In addition, the fuel cell stacks might be arranged differently from what is shown in Figure 10. For example, the structure could support eight fuel cell stacks in two layers, i.e., an indicative of an "intermediate layer" <sup>between</sup> within the fuel cell pack. See Column 3, Lines 25-42; Column 4, lines 49-61; Column 5, Lines 12-21.

Walsh does not specifically teach the presence of a porous fuel diffusion member and a porous air diffusion member in the fuel cell stack. However, it is the position of the examiner that such

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components are inherent in conventional proton exchange membrane fuel cell. This is evidenced in Kordesch et al., in which two porous carbon diffusion electrodes are in contact with the Nafion membrane. See pages 75-76. A reference which is silent about a claimed invention's features is inherently anticipatory if the missing feature *is necessarily present in that which is described in the reference*. In re Robertson, 49 USPQ2d 1949 (1999). With respect to claims 6 and 15, the porous air diffusion member has flow channels as shown in Figure 4-18 of Kordesch et al. With respect to claim 10, the fuel is supplied to the anode through fuel source (16), which is located at the center of the fuel cell stacks. See Figure 1.

***Claim Rejections - 35 USC § 103***

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 3-5,12-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Walsh (US 6,110,612) and Kordesch et al., (Fuel Cells and Their Applications) as applied to claims 1,6,9-11,15 above, and further in view of Besmann et al. (US 6,037,073).

Walsh and Kordesch et al. disclose a fuel cell pack as described above in Paragraph 7. However, Walsh and Kordesch et al. do not disclose that the gas diffusion membrane is a carbon-plastic composite. Besmann et al. teach the fabrication of a single monolithic electrode/diffuser

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(diffusion member) fuel cell component. The component is prepared using a mixture of carbon fibers and phenolic resin powder. The resulting electrode/diffuser can avoid fluid leaks and ohmic losses generally associated with conventional discrete separator/gas diffusion plate. See Column 2, Lines 52-24; Column 3, Lines 1-5; Column 4, Lines 36-40. Therefore, it would have been obvious to one of ordinary skill in the art to use a carbon-plastic composite as the porous fuel diffusion member and air contact member in the fuel cell pack of Walsh and Kordesch, because Besmann et al. teach the gas diffusion members made of carbon-plastic composite have superior property in terms of less fluid leaks and ohmic losses.

***Allowable Subject Matter***

10. Claims 2,7,8,16 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims. Claim 2 would be allowable because the prior art does not disclose or suggest the fuel inlet and fuel outlet are disposed on the anode end plate. Claims 7,16 would be allowable because the prior art does not disclose or suggest the electrical connection member has a shape of a mesh. Claim 8 would be allowable because the prior art does not disclose or suggest through holes in the collector correspond to those in the cathode end plate one to one.

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*Conclusion*


11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Spaeh et al. (US 5,688,610) teach a fuel cell arrangement with a plurality of spaced-apart solid oxide fuel cell stacks.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dah-Wei D. Yuan whose telephone number is (703) 308-0766. The examiner can normally be reached on Monday-Friday (8:00-5:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick J. Ryan, can be reached on (703) 308-2383. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

Dah-Wei D. Yuan  
November 8, 2002

  
Dah-Wei D. Yuan  
Examiner